Water Softening and the Environment
Do You Use A Water Softener?

If your answer is "Yes", this document contains information for you on how to optimize its usage, resulting in lower salt costs for you and benefits for the environment.

The City of Chilton softens the water to your home or business with large municipal Ion-exchange (salt) softeners. The water supply is softened to an average hardness of 5 grains per gallon, which is considered to be between soft and moderately hard water.

The salt used by the municipal softeners and each homeowner's softener passes through the wastewater treatment plant and ends up in neighboring lakes, streams, rivers, and groundwater. Also, the salt spread on roads, driveways and walks ends up in lakes, streams, rivers, and groundwater. The cumulative effects of the salt used can have toxic effects for aquatic plants and animals.

Why Is Salt A Problem?

Based on estimates from the Salt Institute, in 2007, Americans spent approximately $401 million to purchase 3.5 million tons of salt for use in water softeners.

The primary salt utilized in home water softeners is sodium chloride (NaCl), a naturally occurring and commonly used substance. NaCl normally breaks down into sodium (Na+) and chloride (Cl-). These elements are discharged to the local wastewater treatment plant via sanitary sewers. It passes through the treatment plant and is discharged to surface water, where the chloride may impact freshwater organisms and plants, from plankton to fish, by altering reproduction rates, increasing species mortality and changing the characteristics of the entire local ecosystem. In addition, as chloride filters down to the water table, it can stress plant respiration and change the desirability of our drinking water.

How Does A Water Softener Work?

In many Wisconsin communities, people use water softeners to remove minerals from their water that cause hardness. An Ion-exchange process is the traditional method of removing hardness from water. Hard water passes through a column of sodium charged resin, where hard water Ions such as calcium and magnesium are removed from the water by exchanging places with the resin-bound sodium Ions. The water is then said to be "softened."

The resin is "exhausted" when it has given up all or most of its available sodium ions. The resin is then "recharged" with sodium Ions during a process known as regeneration. During this process, the resin is washed with a concentrated brine (salt) solution (most often NaCl) that reverses the hardness removal process. The total regeneration cycle includes backwash, brine regeneration and final rinse. Of the three steps, brine regeneration is the step that you have the most control over.

What Can I Do To Reduce My Salt Usage?

Consider not using your home softener as the water that is delivered to your home is already softened. If you find it necessary to further soften your water, soften only the water that needs to be softened. If you are building a new house, remodeling bathrooms or kitchens, replacing old plumbing or installing a new water softener, consider where your water needs to be softened. Work with your plumber to connect your water softener to only those areas that need softened water.

Places To "Feed" Softened Water Are:

- Hot Water Heater
- Laundry Facilities
- Dishwashers
- Toilets (Consider Low Flush Models)
- Showers

Places To Bypass Using the Water Softener Include:

- Outside Water Spigots For Yard Use
- Cold Tap Drinking Water Lines

By softening more water than what is really needed, you increase the cost of operating your softener (in terms of increased payments for salt and energy), and ultimately, more salt will enter the environment as a result of increased softener regenerations.

Use Minimum Salt Dosage Needed For Regeneration

Water softener regeneration is most efficient at the beginning of the brine cycle. The higher the salt dosage in the cycle, the lower the regeneration efficiency.

By setting your water softener to regenerate more frequently and using less salt for each regeneration, you may be able to increase your softener's regeneration efficiency, which could result in significant salt savings for you.

Consult a qualified water softener representative for details on how to adjust your water softener to minimize salt usage while retaining enough softened water for normal household use.

Switching From A Timer To A Demand Initiated Regeneration Control

Many water softeners regenerate based on a timer typically set to regenerate once every 2 or 3 days, depending on expected water usage and water hardness. By measuring actual demand on the water softener, "demand initiated regeneration", or DIR controls are much more efficient in the regeneration process. These controls use either a flow meter or a harness sensor to determine when to begin the cycle. The "payback" period for adding a DIR control to your water softener from reduced salt usage can be as little as 3 years.

Check with your local qualified water softening representative to see what is appropriate for your particular needs. Even if a newer, more efficient water softener is not in your immediate future, you can still optimize the efficiency of your home unit, resulting in savings for you and the environment.

If You Do Not Own A Home Softener, any water conservation measures you can make will reduce the amount of water softened by the municipal softeners, and therefore, reduce the amount of salt entering the

environment. Installing low flow shower heads, low flush toilets, and only watering your lawn in the evening will help to reduce the volume of water softened.

Also, use salt on walks and driveways wisely. Carefully spread the salt on your driveway and walks so it does not overshoot the intended area. Also, use only the amount of salt that is required to melt the ice and snow.

The Wisconsin Department of Natural Resources (WDNR) has set new limits on the discharge of chlorides from the City's wastewater treatment plant. Chlorides are dissolved solids in the water that cannot be removed through a typical wastewater treatment plant. Treating for chlorides would require exotic treatment technologies that are extremely cost prohibitive; therefore, the only feasible way to reduce chlorides discharged from the treatment plant is to reduce the amount of chlorides sent down the sewer.

To reduce or eliminate NaCl pollution, our best alternative is preventing the pollution at the source of its generation – before it creates a more serious environmental problem or creates serious problems for the wastewater treatment plant.

Please Do Your Part

An Environmental Awareness Message brought to you by:

The Wisconsin Department of Natural Resources

and

City of

Chilton Wisconsin